

**Arizona Department of Environmental Quality UST Program  
Release Reporting & Corrective Action Guidance**

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## **SECTION 3: INITIAL RESPONSE, ABATEMENT, AND CHARACTERIZATION OF CONFIRMED RELEASES**

### **3.1 WHAT IS A RELEASE?**

As defined in A.R.S. § 49-1001(15), a *release means a spill, leak, emission, discharge, escape, leach, or disposal of a regulated substance from a UST into groundwater, surface water or soils.* A release has been confirmed whenever laboratory reportable concentrations of contaminants in soil and/or water attributable to a UST system are discovered.

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### **3.2 NOTIFICATION REQUIREMENTS**

*If it is determined that a release exists, an owner or operator must notify the department, either orally or in writing, within 24 hours of the release confirmation date of any of the following :*

- *A release of a regulated substance.*
- *A spill or overfill of petroleum that results in a release that either:*
  - *Exceeds 25 gallons, or*
  - *Causes a sheen on nearby navigable waters that is reportable to the National Response Center under 40 CFR 110.*
- *A spill or overfill of petroleum that results in a release of 25 gallons or less, that is not contained and cleaned up within 24 hours.*
- *A spill or overfill of a hazardous substance that equals or exceeds its reportable quantity under CERCLA, as implemented by 40 CFR 302.*
- *A spill or overfill of a hazardous substance that is less than the reportable quantity under CERCLA, as implemented by 40 CFR 302, that is not contained and cleaned up within 24 hours [except from A.A.C. R18-12-260(A)].*

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**3.3 NOTIFICATION CONTENT**

*An owner or operator notifying the department of a confirmed release shall provide all of the following (see Appendix C, UST Section Incident Report Form), to the extent known at the time of notification :*

- *Identification of the individual providing notification.*
- *Identification of the UST involved and the reason for confirming the release.*
- *Identification of the facility involved.*
- *Identification of the owner and the operator of the facility involved.*
- *Descriptions of any investigations, containment, and corrective actions taken as of the time of the notice [excerpt from A.A.C. R18-12-260(B)].*

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**3.4 CONFIRMED RELEASE STATUS REPORT**

*An owner or operator shall submit a written report, on a department provided form (see Appendix C), within 14 calendar days after the release confirmation date . The report shall include:*

- *The nature of the release.*
- *The regulated substance released.*
- *The estimated quantity of the regulated substance released.*
- *The estimated period of time over which the release occurred.*
- *A copy of the results of any tightness test performed to confirm the release.*
- *Laboratory analytical results of samples demonstrating the release confirmation.*
- *The initial response and corrective action taken as of the date of the report.*
- *Anticipated corrective actions to be taken within the first 90 days after the release confirmation date [excerpt from A.A.C. R18-12-260(C)].*

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### **3.5 INITIAL RESPONSES**

*An owner or operator shall initiate .... initial response actions within 24 hours of release confirmation .... to prevent further release and identify and mitigate fire, explosion, and vapor hazards [excerpt from A.A.C. R18-12-261(A)].* For further information regarding hazard responses, please contact the local fire authority. These actions are initiated immediately due to the imminent threat to public health, safety and welfare and the environment posed by the existing hazards. Sites which present such hazards typically fall within LUST classification 1 (see Section 3.10).

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### **3.6 INITIAL ABATEMENT**

*Following initial response actions, an owner or operator shall perform the following initial abatement measures as soon as practicable, but not later than 60 calendar days after the release confirmation date :*

- *Remove as much of the regulated substance from the UST system as is necessary to prevent further release.*
- *Visually inspect for and mitigate further migration of any aboveground and exposed below ground release into surrounding soils and surface water.*
- *Continue to monitor and mitigate any fire and safety hazards posed by vapors or free product, and*
- *Check for the possible presence of free product and begin removal (refer to Section 3.9). Factors indicating the presence of free product may include, but are not limited to, free product in storm drains, free product observable as leachate into nearby bodies of surface water or dry surface basins, free product in existing wells located on the site [excerpt from A.A.C. R18-12-261(B)].*

Initial abatement measures are conducted to mitigate hazards of lesser severity than those requiring initial response actions, or to monitor the control of the initial response actions performed. Sites which present such conditions typically fall within or may be classified as LUST classification 2 (see Section 3.10).

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### **3.7 INITIAL SITE CHARACTERIZATION**

*An owner or operator shall develop, from readily available existing sources, initial site characterization information on site-specific geology, hydrology, receptors, potential sources of the contamination, artificial pathways for contaminant migration, and occupancies of the facility and surrounding area. Additionally, if not conducted as part of the investigation of a suspected release, any site check information shall also be included [excerpt from A.A.C. R18-12-261(C)].*

Specifically, the initial site characterization .... information must include, if known, the following:

- *The nature of the release, the regulated substance released, and the estimated quantity of the release.*
- *An estimated time period when the release was occurring.*
- *The initial response and abatement actions performed, and any other corrective actions taken as of the date of the submission.*
- *Estimated or known site-specific lithology, depth to bedrock, and groundwater depth, flow direction, and quality. The date and source of the information must be included.*
- *Location, use, and identification of all registered Arizona Department of Water Resources (ADWR) wells and other wells on and within 1/4 mile of the facility.*
- *Location and type of receptors, other than wells, on and within 1/4 mile of the facility.*
- *Current occupancy and use of the facility and properties immediately adjacent to the facility.*
- *Data on known sewer and utility lines, basements, and other artificial subsurface structures on and immediately adjacent to the facility.*
- *A copy of the report of any tightness test performed during the investigation of the suspected release.*
- *Laboratory analytical results of samples analyzed and received as of the date of the summary.*
- *A site plan showing the location of the facility property boundaries, release, sample collections for samples with laboratory analytical results submitted with this summary, and identified receptors.*
- *The current LUST site classification (see Section 3.10).*
- *Information on any discovered free product (see Section 3.9). Typically, information developed on free product would involve the installation of a vertical extent boring [excerpt from A.A.C. R18-12-261(D)].*



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**3.8 INITIAL SITE CHARACTERIZATION REPORT**

*An owner or operator shall submit the initial site characterization report to the department, on the provided form (see Appendix C), within 90 calendar days after the release confirmation date [excerpt from A.A.C. R18-12-261(D)].*

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### **3.9 FREE PRODUCT**

#### **3.9.1 Introduction**

If, during the investigation of a suspected or confirmed release from a UST, the presence of free product is identified, A.R.S. §49-1005 and A.A.C. R18-12-261.02 requires that, while continuing corrective actions, the removal of the free product must begin as soon as practicable. For more specific guidance regarding the investigation and removal of free product please refer to the EPA document, *HowTo Effectively Recover Free Product at Leaking Underground Storage Tank Sites* (510-R-96-001, 9/96).

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**3.9.2 What Is Free Product?**

Under A.A.C. R18-12-101(57), free product is defined as a mobile regulated substance that is present as a nonaqueous phase liquid, *i.e.*, not dissolved in water. Additionally, the EPA document, *How To Effectively Recover Free Product at Leaking Underground Storage Tank Sites* (510-R-96-001, 9/96), refers to free product as a separate phase liquid in the subsurface that is present in an amount sufficient for the liquid to flow readily into wells or excavations.

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### **3.9.3 Threats to Human Health and Environment**

The presence of free product generally poses three potential adverse impacts to human health and the environment:

- A source of vapor phase discharge of volatile constituents to the surface or confined spaces, potentially resulting in fire, explosion or inhalation hazards;
- A source of direct discharge of product to receptors, such as surface water, wells, springs and basements ; and
- As a source of dissolved-phase constituents in groundwater flowing to receptors, such as surface water, wells, springs and basements.

If, during the investigation of a release, free product is discovered, each component listed above should be taken into consideration in order to reduce the potential hazard to human health and the environment.

The first two components should be assessed promptly, as conditions resulting from the release of product from the UST may pose an imminent hazard. Actions taken to mitigate fire, explosion and vapor hazards are termed initial responses, and should be conducted in a cautious but expeditious manner. The ADEQ Emergency Response Hot Line [(602) 771-2330] and the local fire authority should be contacted immediately if conditions requiring an initial response are suspected or confirmed.

Once the hazards of fire, explosion, vapors or direct discharge are minimal, or have been abated, the actual impact to groundwater quality should be established prior to developing a free product recovery plan. The potential of free product posing a source of contamination to groundwater is dependent on a number of factors, including the type of product released, the volume of free product, the age of the release, plume mobility, groundwater conditions, geology and, in some cases, climate. These factors can influence the impact and duration of groundwater contamination.

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### **3.9.4 Investigation of Free Product**

During the course of site investigation activities, the following conditions may be encountered and may indicate the possible presence of free product :

- C Laboratory analytical results of soil samples indicate that levels of petroleum hydrocarbons are at or near saturation under the chemical/physical in situ conditions of native soils.
- C Laboratory analytical results of non-purge groundwater samples indicate that levels of petroleum constituent(s) are at or near the maximum solubility concentration under the chemical/physical in situ conditions of the aquifer.
- C Free product is visually observed detected by field instrumentation in the soil and/or groundwater.
- C Course-grained, non-cohesive soils with little to no fines (e.g., soils classified by the Unified Soil Classification System as GW, GP, SW, SP) prevent the acquisition of a representative soil sample suitable for laboratory analysis, AND either a notable presence of petroleum odors are associated with the sample upon collection or appropriate field measurements indicate elevated vapor concentrations.

When the above conditions indicate the possible presence of free product , the following common investigative methods can be used to verify whether or not free product exists and should be selected using site-specific conditions:

- C Installation of a vertical extent boring (refer to Section 4.1.4.1) which extends to groundwater.
- Installation of a groundwater monitor well at the source (refer to Section 4.1.5).

Once free product is discovered, the extent and thickness of the free product should be investigated using similar methodology as that described for delineation of contamination in soil and groundwater (see Section 4). All available data should be used to develop an effective strategy to delineate free product. The investigative method chosen should be based on site-specific conditions. Additionally, cost, time and impact to existing operations at the site and existing receptors should be considered when developing an investigative strategy. The free product investigation should:

- C Estimate the duration and volume of release.
- C Evaluate the potential of the free product to reach the water table.

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- C Evaluate probable direction of groundwater flow and free product migration.
- C Delineate the extent and thickness of free product.
- C Assess potential free product removal strategies.
- C Assess the potential impact to receptors.

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### **3.9.5 Free Product Removal**

Free product removal should be evaluated based upon site-specific conditions. Efficiency of free product removal may be affected by the soil characteristics, variability in the subsurface, aquifer hydraulic conductivity, and limits of the technology.

The design and implementation of the method selected for free product removal must meet the requirements of A.R.S. § 49-1005(D) under the constraints of the site-specific conditions. In doing so, the relative degree of potential impacts to public welfare and the environment should be assessed with the associated costs for free product removal and the amount of recoverable free product. For example, hand-bailing may be useful in collecting information for determining which methodology of free product removal is best suited for site-specific conditions or for verifying proper functioning and adequacy of the implemented free product removal method. The department does not consider long-term hand bailing to typically be a cost-effective means of achieving free product removal. However, if long-term hand bailing is selected as the most cost-effective method of free product removal, then site-specific justification must be made to the department showing that the costs expended for the amount of free product recovered is maximized relative to other methods, while minimizing to the extent possible any further potential health and environmental impacts.

If free product removal is not appropriate, the UST Program requires a written justification including a complete scientific analysis of criteria used in the determination. The underlying assumption is that free product removal is necessary to the maximum extent practicable, unless this information provided to the department demonstrates that any or all free product removal is not in compliance with the requirements of CFR § 280.64 and A.R.S. § 49-1005(D) and A.A.C. R18-12-261.02(B).

If free product removal is appropriate, removal should begin as soon as practicable. Please refer to U.S. EPA *How To Effectively Recover Free Product at Leaking Underground Storage Tank Sites* (510/R/96-001, 9/96) for examples of possible methods available for removing free product. The free product removal method chosen should be based on site-specific conditions, be cost-effective, and accomplish the following:

- C Be conducted in a manner that minimizes the spread of contamination by using recovery and disposal techniques, based on site-specific hydrologic, geologic, and demographic conditions.

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- C Treats, discharges, or disposes recovery byproducts in compliance with local, state, and federal regulations.
- C Uses abatement of free product migration as a minimum objective for the design of the free product removal system.
- C Handles any flammable products in a safe and competent manner to prevent fires and explosions.



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**3.9.6 Free Product Storage and Disposal**

Recovered free product and recovery byproducts generated in the course of conducting free product removal must be properly treated, and discharged or disposed of in accordance with A.A.C. R18-12-263(F). This procedure and applicable criteria are discussed in detail in Section 5.6 of this guidance.

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**3.9.7 Free Product Reporting**

Within 45 days after discovering free product, a free product status report shall be submitted to the department [A.A.C. R18-12-261.02(C)]. Full investigation of free product is not required within 45 days. Only that information obtained within the 45 day period should be submitted. When full investigation of free product has been completed, all subsequent information relating to the free product investigation should be submitted with the Initial Site Characterization Report or the Site Characterization Report (SCR), whichever is earliest relative to discovery of the free product. In accordance with A.A.C. R18-12-261.02(C) the UST owner and operator must use the department prescribed free product report form (see Appendix C).

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### **3.10 LUST SITE CLASSIFICATION**

Classification of LUST release sites is specified in A.A.C. R18-12-261.01. Just as in the RBCA Standard Guide for Petroleum Release Sites (ASTM, 1995), four categories are established, as follows:

- C      1: Immediate threat to life and/or health;
- C      2: Short-term threat; impacts <2 years;
- C      3: Long-term threat; impacts >2 years; and
- C      4: No complete exposure pathways or no demonstrable threat.

Classification of LUST sites is a useful tool for the proper allocation of resources to mitigate environmental threats from UST releases in an appropriate time frame. For instance, it is intuitive that an immediate health threat to someone should be protected immediately, while potential threat to someone for exposure in coming years can be protected in a more systematic manner. This LUST site classification tool should not be confused with or interpreted to replace the current LUST case prioritization system which the department has been and continues to utilize. The LUST site classification determination worksheet shown in Table 3.10.a. (also see Appendix C, LUST Site Classification form) is provided to assist the owner or operator in determining which of the four classification categories their particular LUST site may be at any time from LUST release discovery to LUST case closure. Please note that the worksheet is based on the known behavior of typical petroleum constituents in the environment, and is not inclusive necessarily of all petroleum fuel additives or pure non-petroleum compounds regarded as hazardous substances.

LUST site classification 1 indicates that conditions at the site present a current and real threat that requires an immediate response. Examples of such conditions are sites at which vapors have reached concentrations in a building which is causing acute health effects, or have reached a level in any surface or subsurface structure and/or conduit which are explosive or flammable. This differs from classification 2 which has the **potential** to result in the hazards or impacts which are not currently present. Conditions present at Classification 2 sites typically result in impacts developing within a 2 year time period. For example, a classification 2 LUST site may have impacted groundwater at levels which are a risk to human health. However, the contaminated groundwater is **currently not accessed** for drinking water, but a drinking water well **is located downgradient** within a estimated contaminant migration time for impact in less than two years. Classification 3 represents sites in which time of impact is estimated to potentially occur in a time frame exceeding two years. Hence, these site-specific conditions are considered to result in receptor threat only after a longer period of time has elapsed than that for classification 2. Classification 4 is for sites in which

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information available at the time indicates that there is no threat to human health or the beneficial uses of environmental resources. This does not mean that environmental media is not impacted at levels which currently exceed an applicable cleanup standard. Rather, it reflects that exposures and impacts will not occur within a long-term timeframe under the expected uses for the site.

The LUST site classification is based on information known at any particular point during corrective actions. For information that is not known at any particular time in the investigative process, professional judgement should be used to make best educated estimates for unknown parameters.

The LUST site classification should be submitted only at the time of each required report, unless additional information obtained results in a change of LUST site classification or if contamination has moved off-site.

The department may request a re-evaluation of a LUST site classification when information is received that differs from that provided in the most recent classification submitted.

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**Table 3.10.a. RBCA Classification Determination Worksheet**

Criteria for Receptor/Media Impact	Applicable Criteria Status (Circle all that apply)			
Explosive Vapor Levels in Building	Yes	Potential	----	----
Explosive Vapor Levels in Subsurface Conduits	Yes	Potential	----	----
Vapor Levels Causing Acute Health Effects in Building	Yes	Potential	----	----
Vapor Levels Causing Acute Health Effects Outdoors	Yes	Potential	----	----
Free Product in Surface Soils	Yes	----	----	----
Free Product in Subsurface Conduits	Yes	----	----	----
Contaminated Surface Soils	----	R<500'	R<500'	----
Contaminated Subsurface Soils	----	----	Leachable	Non-leaching
Active Drinking Water GW Supply Well Impact (well screened in same interval as plume)	Yes	<2 years*	>2 years*	----
Active Drinking water GW Supply Well Impact (well screened in different interval as plume)	----	Yes	Outside of plume	----
Active Non-potable Use GW Supply Well Impact (well screened in same interval as plume)	----	Yes	>2 years*	----
Active Non-potable Use GW Supply Well Impact (well screened in different interval as plume)	----	----	Yes	Outside of plume
Free Product on Surface Water	Yes	----	----	----
Potable Use Surface Water Impact	Yes	R<500'	R<1500'	----
Non-potable Surface Water Impact	Yes	R<500'	R<1500'	----
RBCA Classification**	1	2	3	4
<p><b>Legend:</b>  <b>R</b> denotes a receptor at the point of exposure (POE) for the applicable environmental medium.  <b>Surface soil</b> is 0-15' bgs for Tier 1 site classification and may be revised during reclassification with justification considering the contaminated interval and associated pathways of exposure identified in the conceptual site model development process.  <b>Subsurface conduits</b> are man-made installations; geological conduits are not included in this classification, but are to be identified and characterized for confirmation of the conceptual site model.  *Time refers to plume migration time to nearest well; if no data are available, assume a plume reach of 380' (UTA, 1997; Lawrence Livermore, 1995)  <b>GW</b> denotes groundwater  <b>**RBCA Classification</b> denotes the ASTM Standard and UST Corrective Action Rule Site Classification System Categories for Risk-based Corrective Action at Petroleum Release Sites</p>				
<p><b>Instructions:</b>  Circle the applicable criteria status for each receptor/medium impact criterion. The RBCA Classification (site classification) is determined by the column farthest to the left for which ANY criterion was circled.</p>				

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Several aspects implied in Table 3.10.a are important to the effectiveness with which sites can be closed. They are itemized in the bullet list following:

- C     The classification system is a classification system, not a prioritization system; all sites must and will be addressed. It is just a question of the time frame in which appropriate action should be taken to protect the public health. It **should not** be an objective of the site classification system to achieve as low a classification as possible in the hope that final action will never be required because of a low “priority” for the site.
  
- C     It must be understood that actions for sites in categories 1 or 2, must be conducted in timely fashion to protect the public health regardless of whether or not pre-approval from the State Assurance Fund (SAF) has been obtained (refer to A.R.S. § 49-1053). This does not prejudice normal application to the SAF for reimbursement. The department generally would consider a site classification of 1 or 2 as requiring continued corrective actions before monies are encumbered for the pre-approval application. However, this determination is assessed on site-specific conditions.
  
- C     The site classification can change with time and with actions taken on the site, usually reducing the classification. For instance, once any immediate actions are taken and potential exposures within a 2-year time frame are controlled, the time to complete site characterization or to complete the activities under the approved Corrective Action Plan (CAP) will proceed in accordance with the department established submittal date for the SCR or approved CAP schedule, as applicable. This would allow for the collection of additional groundwater data demonstrating the effectiveness of natural attenuation processes and selection of the most appropriate remedial corrective action alternative.
  
- C     The site classification system should be used in conjunction with the conceptual site model (CSM) to plan where remedial action can be most effective. For instance, implementation of an interim remedial action might be cost-effective in reducing a site from a 2 to a 3 classification and in breaking a pathway that might otherwise be evaluated as unacceptable exposure. Also, institutional controls to control or break pathways may become apparent in the site classification process.